TAPR/ARRL DCC 2011 Update

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CAO and DSP FlexRadio

FlexRadio Systems
Software Defined Radios
Topics

- Company News
- New Hardware Systems
- PowerSDR™ 2.0 Features
- PowerSDR™ Upcoming Enhancements
We’re Growing!

- Doubled Shipments
- Doubled Office Space 1 June
- Largest Dayton Activity ever
- Streamlined Logistics Center
- New Key Employees
  - Graham Haddock
  - Neal Reasoner
  - Lori Hicks
Amateur Radio Products

- FlexRadio Prominent on Air
- FLEX-1500 Shipping in Volume
- FlexControl™ Shipping
- PowerSDR™ 2.0 Gold
- On plan for Quarterly PowerSDR updates
FLEX-1500

- Introduced before Dayton 2010
- Monumental success!
- We had a lot of trouble keeping up with the demand
- Turned conference room into shipping HQ
FLEX-1500 Ships
Introducing FlexControl™

- Full-Time PowerSDR Tuning
- Programmable Multi-Knob and Push Buttons
- Mode and Status Indicators
- Ergonomic Design
- USB 2.0 Interface
- Custom PowerSDR and DDUtil driver support
- Compatible with FLEX-Series Radios
Commercial/Government Products

- CDRX-3200 and SERX shipping to U.S. Government
- CDRX-1010 shipping to a U.S. System Integrator
- HF Ionosonde Prototype using FLEX-5000A
- New Contract for a 24 channel, Wideband L-Band RX
CDRX-1000

- 10-Channel Synchronous, Coherent Tuning receiver
- Same basic design as CDRX-3200
- 100kHz-100MHz Input
- >100dB 2-Tone, 3rd order dynamic range
- 1 GbE Output, independent routing
- HF Direction Finding
- OTHR
F1 Layer Ionosonde
Sporadic E Layer Ionosonde
PowerSDR 2.0

See it - Work it - Log it

Tune In Excitement!
New User Interface & Skins

- New exciting look
- Uses “skinning” technology with replaceable:
  - Buttons
  - Backgrounds
  - Images
  - Colors
Multi-Radio Launch

- Recognizes multiple radios you have used
- Allows running both a FLEX-1500 and another FLEX at the same time
- Settings across radios are preserved
Automated WBIR

- Direct Conversion has significant benefits over superheterodyne in preservation of linearity
- Single drawback: near-in images can’t be rejected with traditional band reject filters
- WBIR software written by N4HY eliminates this problem, nulling images to the noise floor
Enhanced ALC Algorithms

- Absolute power control
- The setting you set for max power determines power out
Completely Rewritten CW

- CW code was studied and summarily thrown away
- Rewritten from the ground up
Improved TX/RX turn around

- Important for CW and digital modes
- Algorithm choses MIDI when available and falls back to PAL if necessary
Synchronous Recording

- Record RX1 & RX2 synchronously and play both back
- Use ESC (Enhanced Signal Clarity™) on recorded IQ
Greatly improved F3K ATU

- Completely new algorithm
- Your 3:1 ATU is now a 7:1 or greater ATU
- Memory tune
- Antenna profiles
- F5K improved also
FLEX-1500 Support

- Complete support for FLEX-1500 functions
- Integrated custom USB driver
- Designed for low latency from the start
- Excellent CW performance
Integrated Installer

- Installs PowerSDR™, Drivers, Skins, etc. in single install
- Standard wizard-based Installer
PowerSDR 2.1

- Completely Re-factored FM Modes
  - Updated Pre-emphasis / De-emphasis
  - Added CTCSS tones
- New FM Mode Forms
- New Memory Management Form
- Re-factored Audio output level mixing
- Several bug fixes and improvements
- In Final “Release Candidate” status
- Target release July 1, 2011
New FM Mode Panel

- Quick Memory Channel recall
- Transmit Profiles
- Repeater Offsets
- CTCSS Control
Memory Management Form

- Channel GROUP names (Sort by Group)
- Channel Names
- Repeater Offsets including unusual Splits
- Wide and Narrow FM deviation
- Programmable Power and filter levels
PowerSDR 2.2

- Enhanced Signal Clarity™ functionality
- Tracking Notch Filters
- In Alpha status
- Target release Sept, 2011
Enhanced Signal Clarity™

- Synchronous Receivers are the KEY!
- Available on FLEX-5000-RX2 Configurations
- New ESC features:
  - Noise Notching
  - Beam Forming
  - 45deg. and 180deg Phase Angle
  - Quick Jump
Tracking Notch Filter

- Most notches are IF or Audio notches
- The notch moves (not stationary)
- If you notch a birdie or a noise source, then move off frequency, the notch is useless — you have to retune notch stopband
Introducing the TNF
Suppressing Birdies & Noise with Tracking Notch Filters
TNF Controls
Working TNF Controls

Pressing +TNF Adds Notch to Center of Passband
Working TNF Controls

Drag the notch to the desired frequency
Working TNF Controls

Move mouse up/down to increase/decrease the notch width

RF Tracking Notch
14.229 332 MHz
385 Hz wide
Working TNF Controls

Add a second notch by clicking +TNF again
Working TNF Controls

Add as many as you like!
Working TNF Controls

As you tune, the TNF follows RF, not IF/Audio
Working TNF Controls

Vary the depth of the notch
Working TNF Controls

Remember notches
(permanently get rid of noise!)
Questions?